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THE LARGE-WINGED MITES OF FLORIDA

ARTHUR PAUL JACOT

(Continued from page 14)

Zetes minutus (6, p. 121)
Figures 13-16

This species was described in detail in a preceding paper (14, p. 67). This description should be corrected to read: color mahogany. A set of figures is furnished herewith.

Material examined: Two specimens from second growth pine, east of Oscuala Country Club, five miles west of Pensacola, slides G61G1, -G2. One specimen from pine and oak leaves, level but low land, three miles northwest of Milton, slide G62G3. Two specimens from fallen leaves, horticulture grounds, Gainesville, slide G75G2. One specimen from fallen oak leaves, upper edge Devil's Mill Hopper, Gainesville, slide G76G2. Four specimens from fallen leaves, high, dry, under hickory tree, Pinkoson Springs, Gainesville, slides G33G1 to -G3. Two specimens from fallen pine and live oak leaves, Wellborn, slide G115G2. Two specimens from fallen leaves from shore bay under *Tamola littoralis*, seven miles from south point on North Beach, St. Augustine, slide G34G1. Two specimens from fallen pine and oak leaves, six miles south of Belleview, slide G72G2. Sixteen specimens from shore bay debris, Vero Beach, slides G62G1, -G2, -G6, -G8, -G9, -G15, -G20, -G22, -G24, -G27. One specimen from debris, moss, and leaves from radius of about 100 yards among cocoanut trees, ocean and bay side of Lower Matecumbe Key, slide G31G6.

Thus found throughout Florida except (?) the west coast of the peninsula; north to Illinois.

Habitat: Compared with *Zetes weberi* this species is less numerous in the optimum habitat of *Z. weberi*. It occurs in numbers only in the shore bay debris. Does this indicate a drier habitat?

Zetes banksi (9, p. 27)

Figures 17-19

Diagnostic characters: Ventral plate wings quite slender, the anterior end pointed, emarginate on anterolateral edge, very obliquely cut away behind (figure 17); tectopedia II extending laterad much farther than ventral plate wings also emarginate on lateral edge (figure 17); anterior and ventral edge of pteromorphae with conchoidal, subconcentric, crowded, linear ridges (figure 19); pseudostigmatic organs held beneath pteromorphae (figure 17); interlamellar bristles minute; notogaster with median pseudoforamen; adalar porose areas short; genital cover bristles 1 and 4 distinguishable as channels (figure 17); postanal bristles closer together than the two mesal ones are to each other; lateral edge of ventral plate with more densely sclerotized band.

Description: Size fairly large (0.73 x 0.57 mm.); shape ovate; cephaloprothorax conical, the lamellae projecting rather prominently; rostral bristles inserted below bulge of cephaloprothorax, somewhat short, fine, closely appressed; lamellar bristles barely surpassing insertion of rostral (as seen in dorsal aspect), peripheral, closely appressed; interlamellar bristles inserted on a triangular projection of cephaloprothorax!; anterior porose areas short, angularly oval, distant from shadow of tectopedia I; pseudostigmatic organs inconspicuous by reason of being held under pteromorphae, slender, clavate, head decurrent, pointed, closely burred (figures 18, below numeral, which is taken from a dissection, while the figure above the numeral is with foreshortened head, as seen in position through the pteromorphae).

Notogaster with distinct anterior edge; anterior muscle scars reduced to two or three small circles; adalar porose areas rather small, appearing angularly oval in dorsal view; mesonotal angularly oval; pteromorphae as seen in dorsal aspect (figure 17), with a little, coarse, wavy veining, fine lined in lateral aspect (figure 19), pivot near dorsal corner, groove fairly broad, bristle insertion small, sculpturing much more extensive anteriorly than in *Zetes corrugis*, coarser and looser, forming a narrower band.

Ventral plate (figure 17) with slender wings; tectopedia III slender, rather short (compared to the large tectopedia II); apodemata similar to those of the *Z. elimatus* group; bristle of parasterna III close to lateral edge of ventral plate; genital aperture with strongly converging sides, anterior edge rather flat, posterior edge gently sinuous, a well marked frame or thickening about anterior half; cover bristles close to lateral edge of covers!, bristles 1 and 4 represented by channel, bristles 2 and 3 near corners; one specimen has three bristles (bilaterally): the anterior one being at the corner and the second one near center of side of cover; paramesal bristles far from aperture, and more anteriad than usual; subanal muscle plate ovate, narrow end anteriad; aperture broad, sides rather strongly converging, anterior corners very oblique, posterior corners strongly marked; pseudofissurae short, subparallel, with a pseudoforamen below its center; paranal bristles laterad of posterior end of pseudofissurae; anterior cover bristles close to anterior edge, as remote as mesal postanal bristles.

Dimensions: The smallest male, average of eight males, average of

eight females and the largest female of the type lot are presented, respectively.

Total length of body	636	714	768	781
L. of notogastral plate	561	583	642	697
Breadth of same	530	547	605	612
Length of pteromorphae	359	372	386	402
Interlamellar bristle span	110	119	132	139
Median l. of ventral plate	519	542	589	612
Camerostome to genit. apert.	95	100	101	105
Length of genital aperture	73	77	93	100
Breadth of same	88	93	108	111
Genital apert. to anal apert.	153	158	177	187
Length of anal aperture	127	136	153	156
Breadth of same	145	155	170	179

Though this species superficially resembles the *Zetes elimatus* group, it differs markedly in its small ventral plate wings (an opposite development) and in most of the diagnostic characters. It therefore typifies a distinct group of which *Zetes corrugis* is a member.

Material examined: Texas: Seventy-four specimens from Austin, Nathan Banks coll., slides 26B95a to -d (*cotypes*). Sixteen specimens from bark of willows, Brownsville, Banks coll., slides 26B93 and 26B98. Three specimens from Victoria, Banks coll., slide 26B3. *Florida:* One specimen from Spanish moss rotting on ground, Sugarfoot Hammock, Gainesville; taken August 25th, 1929 by J. R. Watson, slide 29W8/25-1. Two specimens from Punta Gorda, Banks coll., slide 26B27a. Six specimens from Lake Worth, taken by Slosson, slide 26B97. *North Carolina:* Four specimens from Southern Pines, taken by A. H. Manee, slide 26B83.

Habitat: This may prove to be an arboreal species.

Genus HOLOKALUMMA (9)

Characters: Galumminae having lamellae reduced to closely appressed bands or straps curving down to anterior end of tectopedia II; tectopedia I ental; pteromorphae with transverse groove, the ventral edge undulate but not with well developed notch; midthoracic suture indistinct to lacking, especially in the center; bristles of parasterna I gular in position; genital covers each with at least two marginal bristles; preanal bristles paranal in position; color tan.

Type: *Holokalumma coloradensis* (9, p. 34).

Holokalumma coloradensis (9, p. 34).

Figures 20-26

Diagnostic characters: Porose areas barely longer than broad; median pseudoforamen present; interlamellar bristle insertions minute, bristles apparently undeveloped; lamellar bristles peripheral; rostral bristles inserted near camerostome; distal end of pteromorphae with irregularly concentric corrugations (figures 20 and 26); pseudostigmatic organs clavate,

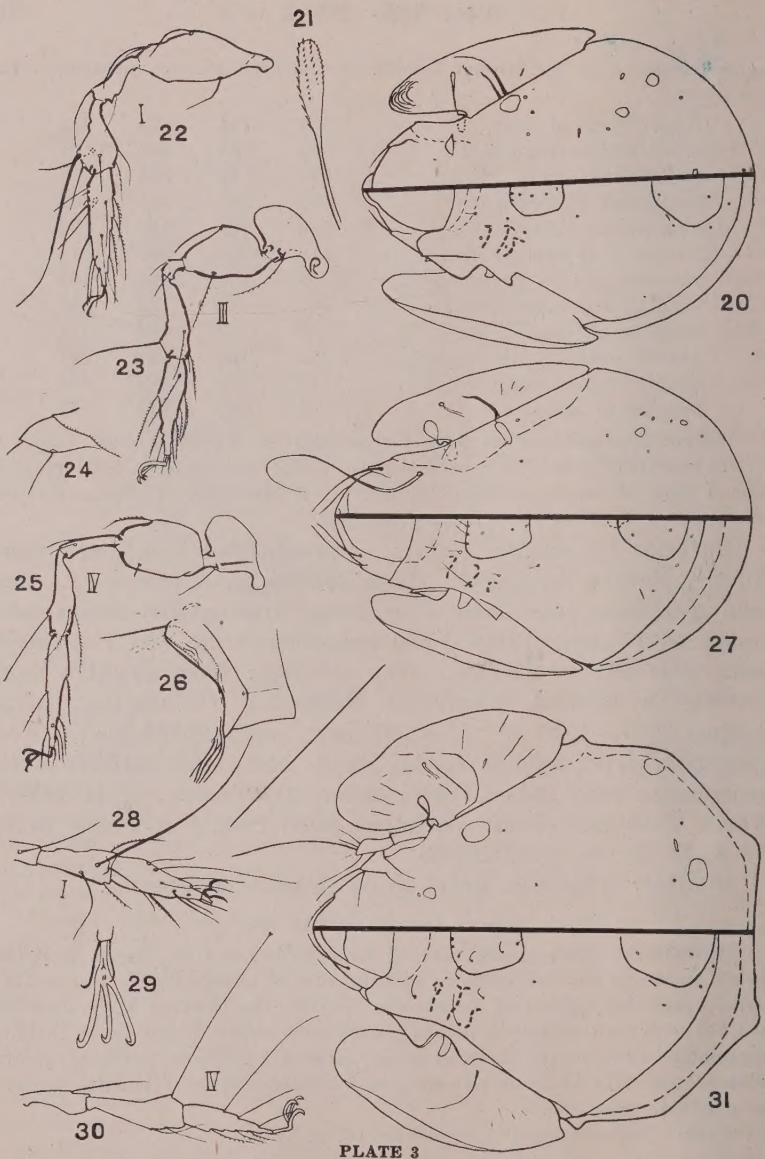

PLATE 3

Holokalumma coloradensis (9, p. 34)

Fig. 20. Dorso/ventral aspects, legs and mouth parts omitted; ratio x100.
Fig. 21. Pseudostigmatic organs; ratio x440.
Fig. 22. Legs I, lateral view; ratio x150.
Fig. 23. Legs III, lateral view; ratio x150.
Fig. 24. Lamella and bristle, from above, showing anterior end of tectopedium I; free hand.
Fig. 25. Legs IV, lateral view; ratio x150.
Fig. 26. Lamella and bristle, from side, anterior end of tectopedium I outlined by a shaded line; ratio x100.

Holokalumma lyricum *sp. nov.*

Fig. 27. Dorso/ventral aspects, legs and mouth parts omitted; ratio x120.
Fig. 28. Legs I, dorsal aspect, slightly warped laterad; ratio x200.
Fig. 29. Unguis III; ratio x440.
Fig. 30. Legs IV, some bristles omitted; ratio x200.

Holokalumma floridae (9, p. 34)

Fig. 31. Dorso/ventral aspects, legs II-IV and mouth parts omitted; ratio x100.

pedicel very slender, head distinct, armed with minute barbs, distal end rounded (figure 21); paranal bristles posteriad of pseudofissurae.

Description: Size medium (0.53 x 0.4 mm.); shape oval, compact; cephaloprothorax with sides subparallel and somewhat steep and blunt (figure 20); rostrum slightly projecting beyond general outline (figures 20 and 26); lamellae appear remote from vertex in dorsal view (figures 20 and 24), angle low down on sides of cephaloprothorax; tectopedia I (figures 24 and 26, shaded line) conspicuous, undulate; lamellar bristles rather short, not reaching end of rostrum, peripheral; rostral bristles appressed to rim of camerostome, rarely visible from above (the upper line in figure 24 is the edge of the camerostome); anterior porose areas oval, overhanging tectopedia I; adalar porose areas appear broader than high in dorsal aspect, the others smaller, rather roundish; median pseudoforamen has much the appearance of a small porose area; pteromorphae as above described, transverse groove conspicuous, pseudofissura short.

Ventral plate (figure 20) smooth, wings very narrow, broadly exposing tectopedia II; tectopedia III very short; tectopedia IV well developed, the angle somewhat produced; lateral edge of acetabulae I projecting prominently anterior to tectopedia II; apodemata fairly well developed with well-developed ceriphs, apodemata IV unusually close to apodemata II-III; bristles arranged as in figure 20; genital aperture with sides subparallel; corners broadly rounded, anterior and posterior edge only slightly undulate; cover bristles 2 and 3 midway between median and lateral edges of cover, bristles 1 and 4 subequally distant from anterior and posterior edges respectively, bristles 2 and 3 unusually close to each other; paramesal bristles closer to genital aperture than diameter of a cover; anal aperture fairly close to posterior edge, angular, posterior edge angularly bent to meet very converging sides, cover bristles distant from median edge, rather close to posterior edge, the anterior pair quite close to anterior edge; mesal pair of postanal bristles more remote than cover bristles, lateral pair as remote as diameter of aperture; pseudofissurae very short.

Legs fairly slender, with triheterohamate ungues. Legs I (figure 22) with tarsi unusually slender for this group, dorsoproximal quartette with the second and third bristles reduced to minute size, proximal bristle inserted a distance equal to diameter of pedicel of tibia from proximal end of segment, not long; fourth bristle inserted diameter of tarsus from proximal end of same, much longer than bristle 1, gracefully curved; a mesal bristle inserted on transverse plane slightly proximad of bristle 4; fifth bristle little longer than proximal, inserted slightly distad of center of segment, slightly barbed, dorsoproximal pair not reaching ends of extended hooks, slightly barbed; dorsodistal pair not inserted on same transverse plane, not extending to end of extended hooks, burred; ventral face with four ciliate bristles, proximal one inserted on transverse plane of mesal, the third the longest and most ventral; a ventrolateral bristle inserted on transverse plane slightly distad of fourth ventral; ventral pair (opposite dorsoproximal pair) barbed, shorter than dorsoproximal, ventrodistal weakly barbed; distal bristles as usual. Tibiae much broader and shorter than tarsi; major bristle very long, extending beyond hooks of tarsi when depressed, dorsodistal bristle reaching base of fourth dorsal bristle of tarsus when depressed, dorsomesal bristle inserted on transverse plane of

major, quite long, reaching to midpoint of major, slightly barbed; ventrodistal bristle inserted close to distal edge of segment, bilaterally ciliate, reaching base of ventroproximal of tarsus; ventroproximal bristle inserted on transverse plane of major, faintly barbed; lateral bristle inserted on transverse plane distad of major, ciliate, reaching base of lateral of tarsi. Genuals nearly as long as their tibiae, dorsal bristle inserted near distal edge, crossing major, smooth; mesal bristle inserted diameter of pedicel of genual distant from distal end of segment, rather short, stiff, burred; ventral bristle inserted on transverse plane proximad of lateral bristle; longer than lateral bristle, barbed. Femora elongate oval, with dorsal outline concave distad of dorsal proximal bristle, and ventral outline concave distad of ventral bristles; dorsoproximal bristle inserted proximad of center of segment, reaching beyond base of dorsodistal pair, stout, curved, stoutly barbed; dorsodistal bristles inserted more than diameter of pedicel of genual from distal end of segment, the longer reaching beyond middle of genual, barbed, the shorter also barbed; ventral bristle inserted on proximal third of segment, similar to dorsal, but shorter.

Legs II similar but shorter and more slender. Tarsi with dorsal bristles relatively shorter and straight, all barbed except proximal; ventral bristles all ciliate, more strongly so than in tarsi I. Tibiae with heavy pedicel, distal end only a little broader; major bristle inserted near distal end of segment, reaching to curve of tarsal hooks; mesal bristle inserted diameter of segment from its distal end, straight, bilaterally ciliate, longer than half major; ventrodistal bristle inserted near ventroproximal, long ciliate; genuals considerably shorter than their tibia, nearly straight; mesal bristle inserted just distad of center of segment, reaching nearly to base of mesal bristle of tibiae, bilaterally ciliate; ventral bristle inserted a short distance from distal end of segment, similar to mesal; dorsal bristle inserted on transverse plane distad of mesal bristle, finer, shorter, nearly smooth. Femora similar, strongly curved, dorsal bristle inserted much more proximad than in femora I; distal pair shorter, subequal; ventral bristle inserted more proximad than dorsal, straight, bilaterally barbed.

Legs III (figure 23) shorter than II. Tarsi with proximal two dorsal face bristles ciliate, third inserted much closer to second than to distal end of segment; five ciliate bristles on ventral face, the proximal somewhat on lateral side, inserted diameter of segment from proximal end; a ciliate bristle inserted on mesal side on transverse plane distad of second dorsal. Tibiae barely broader than tarsus, strongly curved; major bristle reaching base of third dorsal bristle of tarsi, inserted fairly near distal end of segment; three ciliate bristles on ventral face, two inserted close to distal edge, one inserted on transverse plane proximad of major, like one of the ventrals three-fourths length of tibia. Genuals short, as long as width of tibia; dorsal face with a short bristle inserted at distal third, a similar lateral bristle inserted near distal edge. Femora somewhat triangular, with pedicel on ventral edge of proximal face which curves broadly and regularly onto dorsal; dorsal bristle inserted somewhat proximad of center, reaching to center of genual, burred; ventral bristle inserted at distal three-eighths, slightly over three-fourths length of segment, bilaterally barbed. Trochanters casquelike, with short, straight ventral edge; ventral bristle inserted at distal third of ventral edge, long, weakly ciliate.

Legs IV (figure 25) the slenderest. Tarsi slenderly clavate; dorsoproximal bristle inserted slightly proximad of center, when depressed not reaching distal end of segment, weakly barbed; dorsodistal bristle inserted conspicuously nearer distal end of segment than to dorsoproximal bristles, reaching almost to end of extended hooks, burred; ventral face bristles ciliate, proximal inserted slightly proximad of proximal third of segment, reaching beyond insertion of second bristle; second bristle inserted slightly distad of distal third of segment, reaching distal end of segment; distal pair inserted midway between second dorsal and distal end of segment (that is, slightly distad of dorsodistal), a lateral bristle inserted on transverse plane a little proximad of dorsodistal. Tibiae considerably stouter, somewhat curved; major bristle inserted diameter of tarsus from distal end of segment, not reaching dorsoproximal bristle of tarsi; the two ventral bristles inserted, if anything distad of transverse plane of major, ciliate, reaching base of ventroproximal. Genuals long and slender, faintly bent; dorsal bristle inserted near distal end, barely reaching beyond its segment; lateral bristle similar to dorsal but inserted slightly more proximad and slightly longer. Femora high, flattened, oval; dorsal bristle stout, burred, inserted distad of center, reaching a little beyond its segment; ventral bristle inserted more distad than dorsal. Trochanters quite similar to coxae III, the bristle more slight.

Material examined: Three specimens from second growth pine, east of Oscuala Country Club, five miles west of Pensacola, slides G616G3 to -G5. Six specimens from fallen pine and oak leaves, level, low land, three miles northwest of Milton, slides G62G1, -G2, -G4 to -G7. Two specimens from fallen leaves, horticulture grounds, Gainesville, slides G73G1 and G75G3. One specimen from fallen, dry, oak leaves, fifty yards west of preceding lots, slide G84G2. Two specimens from spanish moss rotting on ground, Sugarfoot Hammock, Gainesville; taken August 25th 1929 by J. R. Watson, slide 29W8/25-3. One specimen from dead magnolia leaves (top only), Sugarfoot Hammock; taken September 8th 1929 by Watson. Two specimens from fallen pine and live oak leaves, Wellborn, slide G115G5. Two specimens from shore bay debris, Vero Beach, slides G67G10, -G28. Fourteen specimens from fallen dry leaves, Miami, slides G93G1 to -G4.

Holotype from Mt. Richtophen, Colorado; taken by Baker, slide 26B101. It was surprising to find this western montane species, not yet known from elsewhere, in Florida.

Habitat: Its preference seems to be on the dry side of the forest floor.

Holokalumma lyricum ***sp. nov.***

Figures 27-30

Diagnostic characters: Interlamellar bristles extremely long (figure 27); pseudostigmatic organs short, with broad, obovate head; lamellar

bristles lateral; anterior porose areas lacking!; with genital cover bristles 1 on anterior margin; paranal bristles as distant from aperture as smallest diameter of a genital cover; pseudofissurae anterior to paranal bristles.

Description: Size medium (0.53 x 0.4 mm.); color yellowish; shape pyriform (figure 27); cephaloprothorax narrow for its length; rostrum not conspicuous, the frons steep just above it; rostral bristles rather long, inserted relatively far back, stout, slightly barbed; lamellar bristles long, reaching anterior to rostral, lateral; lamellae distinct well up onto top of cephaloprothorax, protruding somewhat from its surface; interlamellar bristles far longer than any species yet known to me, projecting far in advance of cephaloprothorax (figure 27), stout at proximal end, inserted close to tectopedial shadow which is unusually narrow; pseudostigmatic organs as above described, in some specimens the head is angular, that is, pentagonal to hexagonal, in others smooth, a few fine bristles or barbs seem to be present on the surface.

Notogaster entirely fused to cephaloprothorax; adalar porose areas inconspicuous, elongate, short and narrow; mesonotal porose areas small, the mesal one comprising about nine "pores". I believe these areas are colorless, probably thinly sclerotized areas, as I have seen such thin, colorless plates in the body. Insertions fairly normal, see figure 27; pteromorphae with nearly no veining, groove open anteriorly, that is, only posterior rib well developed, insertion and its channel well developed, pseudofissura very fine, over the hinge line.

Ventral plate wings slender, posterior corner cut off to broadly expose tectopedia II which are very thin, colorless and granular (figure 27); tectopedia III slender, tectopedia IV elongate, no tectopedial bristles; apodemata I short with strongly developed median hook; apodemata II-III similar, reaching well down sides of unusually anteriorly situated genital aperture; apodemata IV semicircular!; gular bristles remote; bristle mesad of apodemata II-III has moved up to mesal end of apodemata I; bristle of parasterna III long, inserted close to proximal end of apodeme (as seen in ventral aspect); bristle mesad of apodemata IV between apodemata IV and aperture (that is, unusually far forward); genital aperture with anterior and posterior edges undulate, anterior edge long, anterior corner well built out; bristles 1 on anterior margin, bristles 4 just off posterior margin, like bristles 2 and 3, nearer median than lateral margins; paramesal bristles just posteriad of posterior edge of aperture, less than smallest diameter of genital cover from aperture; anal aperture with very weak anterior edge, sloping rapidly into sides, posterior angle distinct; anterior cover bristles close to lateral edge, posterior bristles equally close to median edge; paranal bristles as above described; lateral pair of postanal bristles slightly more remote than diameter of aperture, mesal pair more remote than posterior cover bristles.

Legs with hooks *equally* developed (figure 29). Major bristles (of tibiae) very long (figures 28 and 30) those of legs III and IV terminated by a disclike or butterflylike expansion (figure 30); tarsi I with dorsoproximal quartette reduced to two, of which one has become a major, extending far beyond hooks (figure 28). Bristles of legs II similarly developed; dorsoproximal bristle of tarsi of legs IV very long, extending far

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beyond hooks of unguis (figure 30). Bristles of legs III similarly developed.

Mouth parts with bristles so highly developed as to be visible in dorso/ventral aspects as pseudorostral bristles but much finer than the rostral.

Thus it will be seen that this species has gone out into bristle development in different parts, exceeding any other species in the subfamily known to me. Is this due to a gene or a "ductless gland"?

Cotypes: Three specimens from spruce-pine litter of burned over land, Campville; taken March 18th, 1928 by E. F. Grossman, slides G47G2 and -G3.

It is astonishing that this species should not have been collected around Gainesville, which is only ten miles west, or at some of the other nearby localities. This may indicate a preference for needle litter.

Holokalumma floridae (9, p. 34)

Figure 31

Diagnostic characters: Posterior edge of notogaster angled by knob-like projections (figure 31); pseudostigmatic organs small, with obovate head; interlamellar bristles lacking; porose areas large, oval.

Description: Size medium (0.66 x 0.56 mm.); color rusty red; body broad (probably rather flat), nearly heptagonal (figure 31), the anterior sides being by far the longest; cephaloprothorax broad and short; rostrum inconspicuous, rostral bristles fairly long, closely appressed, touching, strongly barbed, inserted well back near edge of camerostome; lamellar bristles rather stout, stiff, distal ends distant from end of rostrum, inserted on lateral edge of closely appressed lamellae which extend dorsad to nearly laterad of insertion of interlamellar bristles; anterior porose areas well developed, posterior to interlamellar insertion; pseudostigmatic organs as above described.

Notogaster as above described, posterior knobs distinct, lateral angles not so prominent, angles for reception of posterior end of pteromorphae

projecting as lips (figure 31); adalar and mesonotal porose areas broad oval, conspicuous as *dark* spots, mesal mesonotal unusually posteriad; pteromorphae held out more than usual in the genus, pseudofissurae distinct, far from hinge line, groove broad, rib not dark except at proximal end though distinct, insertion and channel on anterior edge of groove, veins few, indistinct, broken. In one specimen the ventral rim seems to be paralleled by two or three corrugations.

Ventral plate wings rather narrow, broadly exposing the broad triangular tectopedia II; tectopedia III slender, fairly long; tectopedia IV short; apodemata I with well-developed anteriorly-turned hook; apodemata II-III longer, with two well-developed ceriphs; apodemata IV fairly long, sigmoid; bristle of parasterna I present, no gular bristle! There seem to be two bristle punctures (no bristles) between parasterna II and genital aperture, other parasternal bristles as usual, that of parasterna III quite long; genital aperture quite large, anterior edge smoothly bowed, posterior edge undulate; cover bristles 1 almost on anterior edge, bristles 4 almost on posterior edge, nearer median edge than lateral, bristles 2 and 3 nearer lateral edge; paramesal bristles on transverse plane just posteriad of aperture, but less than smallest diameter of a cover laterad of aperture; anal aperture with fairly well defined anterior corner, posterior edge angled so as to make the aperture hexagonal; anterior cover bristles near anterior corner; posterior bristles slightly more approximate than anterior pair; pseudofissurae fairly short, oblique, situated about the center of the side of the aperture; paranal bristles distant from aperture and pseudofissurae (figure 31); mesal pair of postanals more remote than anterior cover bristles, lateral pair more remote than diameter of aperture.

Legs with ungual hooks equally stout. Major bristle of tibiae I very long (figure 31, where it is seen standing out from beneath the genual); mesal bristle of tibiae I also very long, reaching beyond center of cephalothorax. Other leg bristles not extraordinarily developed, though major bristle of tarsi I is more developed than in Zetes.

Bristles of mouth parts (specially the palps) unusually long so that they project beyond rostrum (not figured, see 10, p. 20, fig. 3).

Cotypes: Five specimens from Cocoa; collected by J. R. Watson, slide 26B100.

Thus the species of *this genus* are very distinct one from the other, presenting extreme specializations not found in Zetes. The genus originated earlier than Zetes and thus has had time to go further, loosing intermediate species. A primitive character found in two of the species is the poor development of the porose areas. Specialized characters found in at least two of the species are (1) the rather posterior position of apodemata II-III (relative to anterior corner of genital aperture), (2) anterior position of genital aperture forming a shorter sternal area, (3) anterior position of paramesal bristles, (4) lateral position of paranal bristles, (5) extreme anterior position of bristles usually found mesad of apodemata II-III and IV.

Galumna lanceatum octopunctatum (5, p. 356)
(13, p. 91, pl. 10, figs. 5-10)

Florida material examined: Nineteen specimens from moss on trunk of Cabbage Palmetto (Magnesia), Alachua Co.; taken December 10th 1928 by J. R. Watson, slides 28W12/10-0, -1, -2. Nine specimens from *Stereum hirsutum* on log, Sugarfoot Hammock, Gainesville; taken December 17th 1928 by Watson, slide 28W12/17-1. One specimen from moss and ferns on limb of live oak, Sugarfoot Hammock; taken December 17th 1928 by Watson, slide 28W12 17. One specimen from grey, matty moss on tree trunks, Sugarfoot Hammock; taken December 30th 1928 by Watson, slide 28W12 30. One specimen from lichens on oak trunk, Sugarfoot Hammock; taken September 8th 1929 by Watson, slide 29W9/8-1.

These records show this species has a marked tendency to live on trees. It was not secured from at least sixty-five litter lots of the Grossman collection. These Florida specimens do not have the cluster of clear spots (pseudoforamina) on anterior end of notogaster. An anal cover occasionally has three bristles, the extra one being nearer the anterior than the posterior bristles.

Figure B. **Galumna alatum hispidum** *subsp. nov.* 32. Pseudostigmatic organs; ratio x440. 33. Region of anal aperture; ratio x120.

Galumna alatum hispidum *subsp. nov.*

Figures 32 and 33

Diagnostic characters: Pseudostigmatic organ head intermediate in diameter between the two described forms but quite bristly (figures 32); notogaster of the species; sternal bristles reduced to one pair; genital cover bristles 1 posterior to marginal bristles; anal pseudofissurae tend to swing laterad of paranal bristles; lateral postanal bristles much more approximate than diameter of aperture (figure 33); anterior anal cover bristles near anterior edge of covers.

Material examined: Sixteen specimens from wet, fallen leaves, horticulture grounds, Gainesville, slides G13G1 to -G5 (*cotypes*). One hundred fifteen specimens from live oak litter, Gainesville, slides G11G1 to -G12, -G14 to -G23. Five specimens from oak debris, Fort White, slide G126G1.

Habitat: This species seems to be quite local or spotty in distribution.

Galumna curvum (4, p. 113)
(9, p. 109, figures 26-34)

Florida material examined: Two specimens from fallen pine and live oak leaves, Wellborn, slide G115G4. One specimen from bark taken from Magnolia tree 20 feet in diameter, one to five feet up the tree. horticulture grounds, Gainesville, slide G43G1. Four specimens from fallen leaves, horticulture grounds, Gainesville, slides G73G2, G75G2, -G9. Fourteen specimens from fallen leaves, high, dry, under hickory, Pinkoson Springs, Gainesville, slides G33G1, -G3 to -G6. One specimen from fallen long-leaf pine needles, south shore of Newmans Lake (Gainesville), slide G54G1. Three specimens from fallen leaves, oak woods, one mile west of Green Cove Springs on state road, slides G80G2, -G4. Two specimens from dry grass (Andropogon), Astor, slide G94G2. Twenty-five specimens from fallen water oak leaves, one mile east of Mulberry, slide G103G2, -G3, -G6. Eighteen specimens from fallen leaves and grass, old laboratory, Bradenton, slides G44G1 to -G4, -G8, -G10, -G12 to -G14, -G17. Nine specimens from same niche and locality as last, slides G87G4 to -G8. One specimen from Cortez, slide G45G3. Nine specimens from shore bay debris, Vero Beach, slides G67G15, -G16, -G19, -G23, -G25, -G26. One specimen from debris from hammock, Fort Lauderdale, slide G113G1.

Probably found throughout the state, north throughout the transitional life zone.

Habitat: Common on the forest floor and on trees.

Galumna flagelliferum (9, p. 31)
(13, p. 106, pl. 12, figs. 23, 25)

Florida material examined: Six specimens from fallen live oak leaves, Fernandina, slides G40G1 to -G6. Nine specimens from fallen pine and live oak leaves, Wellborn, slides G115G1, -G5. Three specimens from fallen leaves, horticulture grounds, Gainesville, slides G75G6, -G7. One specimen from large leaves from the wood fern common in Florida, Gainesville, slide G111G1. One specimen from spanish moss rotting on ground, Sugarfoot Hammock, Gainesville; taken August 25th 1929 by Watson, slide 29W8/25-1. One specimen from *Stereum hirsutum* on rotten limb, Sugarfoot Hammock; taken September 8th 1929 by Watson, slide 29W9/8-1. Two specimens from dry leaves, north facing slope, Devil's Mill Hopper, Gainesville; taken March 4th

1929 by Watson, slide 29W3/4. One specimen from fallen leaves, high, dry, under hickory tree, Pinkoson Springs, slide G33G2. One specimen from fallen long-leaf pine needles, east shore of Newmans Lake (Gainesville), slide G54G5. Three specimens from same but south shore, slide G55G8 to -G10. One specimen from fallen pine and oak leaves, six miles south of Belleview, slide G72G3. One specimen from fallen leaves and grass, old laboratory, Bradenton, slide G44G5. Two specimens from Cortez, slide G45G5. Seven specimens from fallen elder leaves, White City, slides G108G1, -G2, -G6. Six specimens from fallen dry leaves, Bonita Springs, slides G95G1, -G2. Three specimens from fallen pine and oak leaves, between Redland and Homestead, slides G32G3 to -G5.

Thus found throughout peninsular Florida, north throughout the upper austral and west to Texas.

Habitat: A common denizen of the pine-oak litter and other fairly dry types of litter.

Galumna flagelliferum circulum *subsp. nov.*

Diagnostic characters: As the species but adalar and mesonotal porose areas small, circular, the latter quite remote; mesal mesonotal insertion much more remote than the adalar, the latter very close to their porose areas; anal pseudofissurae quite long, at posterior third of aperture; size much smaller and relatively shorter (0.47 x 0.34 mm.).

Material examined: One specimen from Cortez, slide G45G4. Three specimens from shore bay debris, Vero Beach, slides G67G4, -G5, -G7 (*cotypes*). Nine specimens from fallen dry leaves, Miami, slides G93G1 to -G4.

KEY TO GENERA

1. Lamellae terminating at insertion of lamellar bristles 2
1. Lamellae (when present) curving ventrad then posteriad to fuse with tectopedia I 3
2. Body slender; anterior edge of pteromorphae rounded ..... *Protokalumma*
2. Abdomen broad; anterior edge of pteromorphae pointed often terminating in a minute cusp ..... *Parakalumma*
3. Anteroventral edge of pteromorphae evenly rounded, not emarginate —*Holokalumma*
3. Anteroventral edge of pteromorphae variously emarginate 4
4. Midthoracic suture (anterior edge of notogaster) distinct ..... *Zetes*
4. Midthoracic suture hazy under high power, especially about the median plane ..... *Galumna*

KEY TO ZETES

1. Interlamellar bristles quite short 2
1. Interlamellar bristles as long or longer than pseudostigmatic organs 6
2. Pseudostigmatic organ head fimbriate along anterior and distal edge —*Z. minutus*

2. Pseudostigmatic organ head not rougher than barbed 3
3. Lamellar bristles mesal 4
3. Lamellar bristles peripheral 5
4. Pteromorphae smooth ..... *Z. weberi*
4. Pteromorphae sculptured ..... *Z. w. plumalae*
5. Pteromorphae sculptured; notogaster with mesal pseudoforamen —*Z. banksi*
5. Pteromorphae smooth; notogaster with no mesal pseudoforamen —*Z. elimatus louisianae*
6. Lamellar bristles peripheral 8
6. Lamellar bristles lateral ..... *Z. bradleyi*
6. Lamellar bristles mesal 7
7. Pteromorphae sculptured ..... *Z. emarginatus*
7. Pteromorphae smooth ..... *Z. e. laevis*
8. Tectopedia I projecting; ventral plate wings almost covering tectopedia I ..... *Z. macroptera matecumbei*
8. Tectopedia I not distinct; ventral plate wings leaving tectopedia I widely exposed ..... *Z. elegantulus*

KEY TO HOLOKALUMMA

1. Posterior end of notogaster angular, the angles somewhat mammilate —*H. floridae*
1. Posterior end of notogaster smoothly rounded 2
2. Cephaloprothoracic bristles long; anterior end of pteromorphae smooth; pseudostigmatic organ head broad ..... *H. lyricum*
2. Cephaloprothoracic bristles short; anterior end of pteromorphae conchoidally sculptured; pseudostigmatic organ head slender —*H. coloradensis*

KEY TO GALUMNA

1. Pseudostigmatic organs tapering to a point (bristlelike) 2
1. Pseudostigmatic organs becoming broader distally 3
2. Length 0.7 mm. ..... *G. flagelliferum*
2. Length 0.47 mm. ..... *G. f. circulum*
3. Size minute (about 0.3 mm.); rostral bristles not visible in dorsal aspect; lamellar bristles frontal; notogaster with minute bristles and conspicuous roundish adalar porose areas ..... *G. curvum*
3. Size larger 4
4. Interlamellar bristles longer than diameter of tibiae —*G. lanceatum octopunctatum*
4. Interlamellar bristles short ..... *G. alatum hispidum*

FREQUENCY OF OCCURRENCE

In the following table, the 564 specimens secured through the late Edgar F. Grossman in forty-three lots are referred to their respective species and genera. The numerals in parentheses record the number of lots in which each species was found:

1. *Protokalumma depressum* x *pterotum* ..... 8 (2) genus 8 (2)
2. *Parakalumma robustum* 22 (4)
3. *Parakalumma robustum floridanum* ..... 3 (3) genus 25 (7)
4. *Zetes macroptera matecumbei* 13 (2)

5.	*Zetes elegantulus*	2	(1)	and two others
6.	*Zetes emarginatus*	5	(2)	and another
7.	*Zetes emarginatus laevis*	2	(2)	
8.	*Zetes elimatus louisianae*	68	(14)	
9.	*Zetes weberi*	87	(14)	
10.	*Zetes weberi plumalae*	5	(2)	
11.	*Zetes minutus*	33	(10)	genus 215 (30)
12.	*Holokalumma coloradensis*	30	(8)	
13.	*Holokalumma lyricum*	3	(1)	genus 33 (9)
14.	*Galumna alatum hispidum*	136	(3)	
15.	*Galumna curvum*	90	(14)	
16.	*Galumna flagelliferum*	44	(13)	
17.	*Galumna flagelliferum circulum*	13	(3)	genus 283 (24)

(To be continued)

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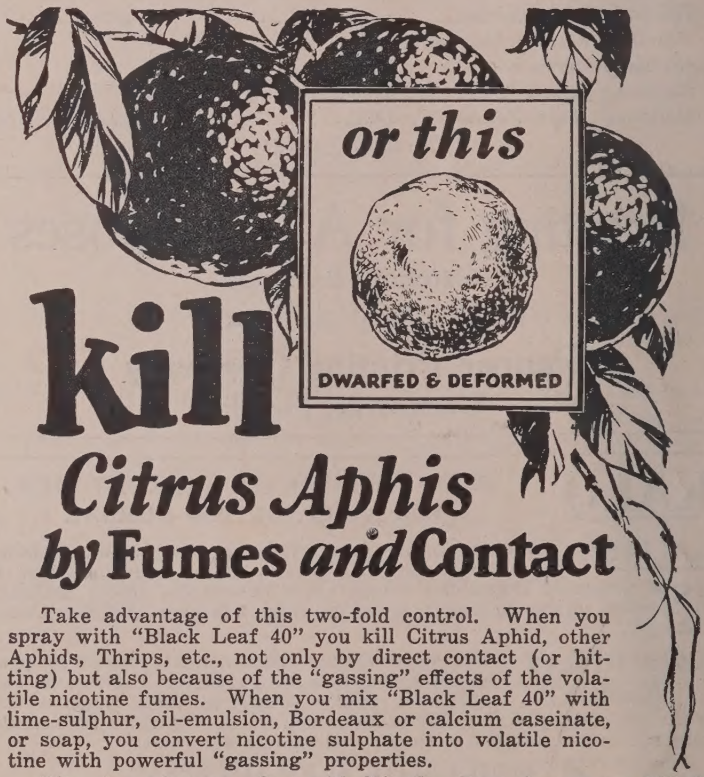

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